STUDY OF TISSUE PHOSPHATASE ACTIVITIES OF BLACK BENGAL KID AFTER INJECTION OF CALCIUM-PHOSPHORUS AND TESTOSTERONE

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ABSTRACT

Alkaline phosphatase and acid phosphatase activities of liver, longissimus dorsi muscle and small intestine of Black Bengal kids were analyzed after injecting calcium-phosphorus and testosterone. Alkaline phosphatase activity did not show any significant difference among the groups. Acid phosphatase activity decreased significantly (P<0.05) in liver tissue of testosterone treated group.

In view of recent scarcity and high prices of feed now it becomes a general tendency to develop and use suitable growth promoter for increase growth rate in any species of animal. But growth promoter should not have any adverse affect on the health of the animal. Phosphatase activities in serum gives an indication of the physiological state of the animal (Kalita and Mahapatra, 1998). Study of these enzymes in the different tissues gives the confirmation about the condition of the animal. Present study was designed to elucidate the physiological state of the animal by estimating acid phosphatase (ACP) and alkaline phosphatase (ALP) activities in the different tissues of Black Bengal kid after using calcium-phosphorus and testosterone as growth promoter.

Three groups were made comprising three months old six healthy Black Bengal kids in each group at Goat Breeding Farm of Orissa University of Agriculture and Technology. Group-1 was control whereas Group-2 animals were treated with calcium and phosphorus (Maculvit and Tonophosphan) at the dose rate of 30mg/kg body weight intramuscularly to each animal twice weekly for one month and after a gap of thirty days again for another period of fifteen days with same dose and interval schedule. Group-3 animals were treated with testosterone (Aquaviron) at the dose rate of 2mg/kg body weight for same period and route as in Group-2. The concentrate ration supplied to the kids was as per recommendation of Ranjhan (1993). At the age of 6.5 months, the animals were sacrificed and different tissues viz., liver, muscle, (longissimus dorsi) and small intestine (duodenum) were collected in 0.154 M potassium-chloride solution. The tissues were homogenized by using 0.154 M potassium-chloride solution at the rate of 10 mg/ml. Supernatant was used to study the ALP and ACP activities as per the method of Bauch and Lomb (1965). The data were analyzed following Snedecor and Cochran (1967).

Results of the experiment of calcium-phosphorus and testosterone on tissue phosphatase activities of Black Bengal kid have been presented in the Table 1. The phosphatase activity of liver and muscle of the control group had good agreement with the report of Vernon et al. (1987). No significant difference was observed among the groups for ALP activities in different tissues. This indicate the healthy bone growth, healthy liver and biliary tract and free from any hepato-cellular toxicity (Varley, 1980). ACP activity was decreased in all the tissues of testosterone treated group but the decreased activity was
Table 1. Effect of calcium-phosphorus and testosterone on phosphatase activities (product formed/min/mg protein at 37°C) of different tissues of Black Bengal Kids.

<table>
<thead>
<tr>
<th>Enzyme</th>
<th>Group</th>
<th>Liver</th>
<th>Longissimus Dorsi muscle</th>
<th>Small intestine</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALP</td>
<td>Gr. -1</td>
<td>5.90±1.70*</td>
<td>4.70±0.54*</td>
<td>48.57±2.66*</td>
</tr>
<tr>
<td></td>
<td>Gr. -2</td>
<td>4.55±1.25*</td>
<td>5.63±0.58*</td>
<td>50.80±10.70*</td>
</tr>
<tr>
<td></td>
<td>Gr. -3</td>
<td>3.09±0.38*</td>
<td>4.84±1.17*</td>
<td>45.00±3.41*</td>
</tr>
<tr>
<td>ACP</td>
<td>Gr. -1</td>
<td>22.21±0.57*</td>
<td>6.62±0.31*</td>
<td>19.73±0.21*</td>
</tr>
<tr>
<td></td>
<td>Gr. -2</td>
<td>16.17±3.73b</td>
<td>7.35±1.85b</td>
<td>21.32±0.19*</td>
</tr>
<tr>
<td></td>
<td>Gr. -3</td>
<td>14.84±0.59b</td>
<td>5.64±0.58b</td>
<td>18.90±0.71b</td>
</tr>
</tbody>
</table>

Superscript bearing different letter in the same column for one enzyme is significant (P<0.05).

Significant (P<0.05) only in liver. Anabolic steroids have the ability of retention of calcium and phosphorus (Gyton, 1976) and the hypercalcaemia and hyperphosphataemia might be the reason for decrease of phosphatase activities in testosterone treated group (Varley, 1980). Significantly (P<0.05) increase ACP activity was observed in intestine of the calcium-phosphorus treated group. Although there is increase or decrease of ACP activities was observed in certain tissues of the treated groups the values were within the range as per Vernon et al. (1987), indicating the healthy condition of all the organ used for collection of tissues. Thus it can be concluded that calcium-phosphorus and testosterone may be used as growth promoter in Black Bengal kid. Further study is required to know the residual affect of calcium-phosphorus and testosterone on meat.

REFERENCES